ArevaEPRDCPEm Resource

From: WILLIFORD Dennis (AREVA) [Dennis.Williford@areva.com]
Sent: Wednesday, November 02, 2011 1:25 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (AREVA); DELANO Karen (AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA); GUCWA Len (EXTERNAL AREVA)
Subject: Response to U.S. EPR Design Certification Application RAI No. 340, FSAR Ch. 6, Supplement 11
Attachments: RAI 340 Supplement 11 Response US EPR DC.pdf

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 5 questions of RAI No. 340 on March 1, 2010. RAI No. 340, Supplement 1 was submitted on April 7, 2010 and provided responses to 2 of the 4 remaining questions. In addition, on April 7, 2010, the schedule for responding to Question 06.02.01-57 was revised to July 15, 2010. On May 12, 2010, the schedule for responding to Question 06.02.01-53 was revised to May 26, 2010. RAI No. 340, Supplement 3 was submitted on May 25, 2010 and provided a response to 1 of the 2 remaining questions. Supplements 4, 5, 6, 7, 8, 9 and 10 responses to RAI No. 340 were submitted on July 14, 2010, November 12, 2010, January 7, 2011, March 3, 2011, May 31, 2011, July 13, 2011 and August 31, 2011, respectively, to revise the schedule for responding to Question 06.02.01-57.

The attached file, "RAI 340 Supplement 11 Response US EPR DC.pdf," provides a technically correct and complete response to the one remaining question. Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 340, Question 06.02.01-57.

The following table indicates the respective pages in the response document, "RAI 340 Supplement 11 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 340 — 06.02.01-57	2	14

This concludes the formal AREVA NP response to RAI 340, and there are no questions from this RAI for which AREVA NP has not provided responses.

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Wednesday, August 31, 2011 6:21 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); GUCWA Len (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 340, FSAR Ch. 6, Supplement 10

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 5 questions of RAI No. 340 on March 1, 2010. RAI No. 340, Supplement 1 was submitted on April 7, 2010 and provided responses to 2 of the 4 remaining questions. In addition, on April 7, 2010, the schedule for responding to Question 06.02.01-57 was revised to July 15, 2010. On May 12, 2010, the schedule for responding to Question 06.02.01-53 was revised to May 26, 2010. RAI No. 340, Supplement 3 was submitted on May 25, 2010 and provided a response to 1 of the 2 remaining questions. Supplements 4, 5, 6, 7, 8 and 9 responses to RAI No. 340 were submitted on July 14, 2010, November 12, 2010, January 7, 2011, March 3, 2011, May 31, 2011 and July 13, 2011, respectively, to revise the schedule for responding to Question 06.02.01-57.

The schedule for responding to Question 06.02.01-57 has been revised as provided below.

Question #	Response Date
RAI 340 — 06.02.01-57	**November 2, 2011**

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Wednesday, July 13, 2011 9:43 AM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); GUCWA Len (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 340, FSARCh. 6, Supplement 9

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 5 questions of RAI No. 340 on March 1, 2010. RAI No. 340, Supplement 1 was submitted on April 7, 2010 and provided responses to 2 of the 4 remaining questions. In addition, on April 7, 2010, the schedule for responding to Question 06.02.01-57 was revised to July 15, 2010. On May 12, 2010, the schedule for responding to Question 06.02.01-53 was revised to May 26, 2010. RAI No. 340, Supplement 3 was submitted on May 25, 2010 and provided a response to 1 of the 2 remaining questions. Supplements 4, 5, 6, 7 and 8 responses to RAI No. 340 were submitted on July 14, 2010, November 12, 2010, January 7, 2011, March 3, 2011, and May 31, 2011, respectively, to revise the schedule for responding to Question 06.02.01-57.

AREVA NP is providing a revised schedule for providing a technically correct and complete response to Question 06.02.01-57, as shown below.

Question #	Response Date
RAI 340 — 06.02.01-57	October 12, 2011

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Tuesday, May 31, 2011 5:23 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); GUCWA Len (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 340, FSARCh. 6, Supplement 8

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 5 questions of RAI No. 340 on March 1, 2010. RAI No. 340, Supplement 1 was submitted on April 7, 2010 and provided responses to 2 of the 4 remaining questions. In addition, on April 7, 2010, the schedule for responding to Question 06.02.01-57 was revised to July 15, 2010. On May 12, 2010, the schedule for responding to Question 06.02.01-53 was revised to May 26, 2010. RAI No. 340, Supplement 3 was submitted on May 25, 2010 and provided a response to 1 of the 2 remaining questions. Supplements 4, 5, 6 and 7 responses to RAI No. 340 were submitted on July 14, 2010, November 12, 2010, January 7, 2011, and March 3, 2011, respectively, to revise the schedule for responding to Question 06.02.01-57.

AREVA NP is providing a revised schedule for providing a technically correct and complete response to Question 06.02.01-57, as shown below.

Question #	Response Date
RAI 340 — 06.02.01-57	July 13, 2011

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WELLS Russell (RS/NB)
Sent: Thursday, March 03, 2011 7:09 AM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); GUCWA Len (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 340, FSARCh. 6, Supplement 7

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 5 questions of RAI No. 340 on March 1, 2010. RAI No. 340, Supplement 1 was submitted on April 7, 2010 and provided responses to 2 of the 4 remaining

questions. In addition, on April 7, 2010, the schedule for responding to Question 06.02.01-57 was revised to July 15, 2010. On May 12, 2010, the schedule for responding to Question 06.02.01-53 was revised to May 26, 2010. RAI No. 340, Supplement 3 was submitted on May 25, 2010 and provided a response to 1 of the 2 remaining questions. Supplements 4, 5 and 6 response to RAI No. 340 were submitted on July 14, 2010, November 12, 2010, and January 7, 2011, respectively, to revise the schedule for responding to Question 06.02.01-57.

To allow time for additional interaction between AREVA and the NRC staff, a revised schedule is provided in this email for Question 06.02.01-57.

The schedule for a technically correct and complete response has been revised as provided below.

Question #	Response Date
RAI 340 — 06.02.01-57	May 31, 2011

Sincerely,

Russ Wells
U.S. EPR Design Certification Licensing Manager
AREVA NP, Inc.
3315 Old Forest Road, P.O. Box 10935
Mail Stop OF-57
Lynchburg, VA 24506-0935
Phone: 434-832-3884 (work)
434-942-6375 (cell)
Fax: 434-382-3884
Russell.Wells@Areva.com

From: BRYAN Martin (External RS/NB)
Sent: Friday, January 07, 2011 5:12 PM
To: Tesfaye, Getachew
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); GUCWA Len (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 340, FSARCh. 6, Supplement 6

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 5 questions of RAI No. 340 on March 1, 2010. RAI No. 340, Supplement 1 was submitted on April 7, 2010 and provided responses to 2 of the 4 remaining questions. In addition, on April 7, 2010, the schedule for responding to Question 06.02.01-57 was revised to July 15, 2010. On May 12, 2010, the schedule for responding to Question 06.02.01-53 was revised to May 26, 2010. RAI No. 340, Supplement 3 was submitted on May 25, 2010 and provided a response to 1 of the 2 remaining questions. Supplements 4 and 5 response to RAI No. 340 were submitted on July 14, 2010, and November 12, 2010, respectively, to revised the schedule for responding to Question 06.02.01-57.

To allow time for additional interaction between AREVA and the NRC staff, a revised schedule is provided in this email for Question 06.02.01-57.

The schedule for a technically correct and complete response has been revised as provided below.

Question #	Response Date
RAI 340 — 06.02.01-57	March 3, 2011

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
Tel: (434) 832-3016
702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (External RS/NB)
Sent: Friday, November 12, 2010 1:46 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); GUCWA Len (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 340, FSARCh. 6, Supplement 5

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 5 questions of RAI No. 340 on March 1, 2010. RAI No. 340, Supplement 1 was submitted on April 7, 2010 and provided responses to 2 of the 4 remaining questions. In addition, on April 7, 2010, the schedule for responding to Question 06.02.01-57 was revised to July 15, 2010. On May 12, 2010, the schedule for responding to Question 06.02.01-53 was revised to May 26, 2010. RAI No. 340, Supplement 3 was submitted on May 25, 2010 and provided a response to 1 of the 2 remaining questions. Supplement 4 response to RAI No. 340 was submitted on July 14, 2010 to revised the schedule for responding to Question 06.02.01-57.

During NRC's September 29-30, 2010 containment audit, AREVA NP discussed the preliminary results of calculations associated with the response to Question 06.02.01-57. To allow time for additional interaction between AREVA and the NRC staff, a revised schedule is provided in this email for Question 06.02.01-57. The revised schedule provides opportunity for the requested NRC audit of the associated water retention calculation.

The schedule for a technically correct and complete response has been revised as provided below.

Question #	Response Date
RAI 340 — 06.02.01-57	January 26, 2011

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
Tel: (434) 832-3016
702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (EXT)
Sent: Wednesday, July 14, 2010 3:14 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC);

GUCWA Len T (EXT)
Subject: Response to U.S. EPR Design Certification Application RAI No. 340, FSARCh. 6, Supplement 4

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 5 questions of RAI No. 340 on March 1, 2010. RAI No. 340, Supplement 1 was submitted on April 7, 2010 and provided responses to 2 of the 4 remaining questions. In addition, on April 7, 2010, the schedule for responding to Question 06.02.01-57 was revised to July 15, 2010. On May 12, 2010, the schedule for responding to Question 06.02.01-53 was revised to May 26, 2010. RAI No. 340, Supplement 3 was submitted on May 25, 2010 and provided a response to 1 of the 2 remaining questions.

To allow time for a more detailed review and for interaction between AREVA and the NRC staff, a revised schedule is provided in this email for Question 06.02.01-57. The revised schedule also provides for more detailed analysis of individual Reactor Building compartments to identify locations where water retention could occur. AREVA anticipates having draft a response available during October to support interaction with the NRC staff to review the responses prior to the formal submittal. AREVA NP discussed the revised schedule with NRC staff on July 14, 2010.

The schedule for a technically correct and complete response has been revised as provided below.

Question #	Response Date
RAI 340 — 06.02.01-57	November 12, 2010

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
Tel: (434) 832-3016
702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (EXT)
Sent: Tuesday, May 25, 2010 4:55 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); GUCWA Len T (EXT)
Subject: Response to U.S. EPR Design Certification Application RAI No. 340, FSARCh. 6, Supplement 3, Part 1 of 4

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 5 questions of RAI No. 340 on March 1, 2010. RAI No. 340, Supplement 1 was submitted on April 7, 2010 and provided responses to 2 of the 4 remaining questions. In addition, on April 7, 2010, the schedule for responding to Question 06.02.01-57 was revised to July 15, 2010. On May 12, 2010, the schedule for responding to Question 06.02.01-53 was revised to May 26, 2010.

Because of the file size, AREVA NP is providing the response to Question 06.02.01-53 in four parts. The four files are designated as “RAI 340 Supplement 3 Response US EPR DC Part X of 4.pdf,” where “X” is one of the four parts. The files provide a technically correct and complete response to 1 of the 2 remaining questions.

Attached is file, “RAI 340 Supplement 3 Response US EPR DC Part 1 of 4.pdf.”

The following table indicates the respective pages in the response document, "RAI 340 Supplement 3 Response US EPR DC Part 1 of 4.pdf," that contain AREVA NP's responses to the subject questions.

Question #	Start Page	End Page
RAI 340 — 06.02.01-53	2	53

The schedule for a technically correct and complete response to Question 06.02.01-57 is unchanged and provided below.

Question #	Response Date
RAI 340 — 06.02.01-57	July 15, 2010

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
Tel: (434) 832-3016
702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (EXT)
Sent: Wednesday, May 12, 2010 4:42 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); GUCWA Len T (EXT)
Subject: Response to U.S. EPR Design Certification Application RAI No. 340, FSARCh. 6, Supplement 2

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 5 questions of RAI No. 340 on March 1, 2010. RAI No. 340, Supplement 1 was submitted on April 7, 2010 and provided responses to 2 of the 4 remaining questions. In addition, on April 7, 2010, the schedule for responding to Question 06.02.01-57 was revised to July 15, 2010.

Because the response to Question 06.02.01-53 is anticipated to include over 200 figures, an additional two weeks is needed to provide a complete and accurate response. As agreed with the NRC staff, the schedule for responding to Question 06.02.01-53 is changed to May 26, 2010. The schedule for responding to Question 06.02.01-57 is unchanged.

The schedule for a technically correct and complete response to the remaining RAI No. 340 questions is provided below.

Question #	Response Date
RAI 340 — 06.02.01-53	May 26, 2010
RAI 340 — 06.02.01-57	July 15, 2010

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
Tel: (434) 832-3016

702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (EXT)
Sent: Wednesday, April 07, 2010 2:55 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); GUCWA Len T (EXT)
Subject: Response to U.S. EPR Design Certification Application RAI No. 340, FSARCh. 6, Supplement 1

Getachew,

The proprietary/SUNSI and public versions of the response to RAI No. 340, Supplement 1 are submitted via AREVA NP Inc. letter, "Response to U.S. EPR Design Certification Application RAI No. 340 Supplement 1 " NRC:10:032, dated April 7, 2010. The enclosure to that letter provides a schedule to provide technically correct and complete response to 2 of the 4 remaining questions in RAI No. 340. The RAI response also contains security-related sensitive information that should be withheld from public disclosure in accordance with 10 CFR 2.390. In addition, an affidavit to support withholding of information that AREVA considers proprietary from public disclosure, per 10CFR2.390(b), is provided as an enclosure to that letter.

A public version with the proprietary and security-related sensitive information redacted is also provided as an enclosure to that letter.

The following table indicates the respective pages in the response document that contain AREVA NP's response to the subject questions:

Question #	Start Page	End Page
RAI 340 — 06.02.01-54	2	10
RAI 340 — 06.02.01-56	11	11

The schedule for a technically correct and complete response to Question 06.02.01-53 is unchanged and provided below. The response to Questions 06.02.01-57 is dependent upon the results of ongoing GSI-191 head loss testing and evaluations which will demonstrate sump strainer performance. Because of the ongoing activities, AREVA NP is not providing a response at this time. The schedule for a technically correct and complete response to Question 06.02.01-57 has been revised and is provided below.

Question #	Response Date
RAI 340 — 06.02.01-53	May 12, 2010
RAI 340 — 06.02.01-57	**July 15, 2010**

Sincerely,

Martin (Marty) C. Bryan
Licensing Advisory Engineer
AREVA NP Inc.
Tel: (434) 832-3016
Martin.Bryan.ext@areva.com

From: BRYAN Martin (EXT)
Sent: Monday, March 01, 2010 3:23 PM
To: 'Tesfaye, Getachew'

Cc: DELANO Karen V (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); ROMINE Judy (AREVA NP INC); GUCWA Len T (EXT)
Subject: Response to U.S. EPR Design Certification Application RAI No. 340, FSARCh. 6

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 340 Response US EPR DC.pdf" provides a technically correct and complete response to 1 of the 5 questions.

The following table indicates the respective pages in the response document, "RAI 340 Response US EPR DC.pdf," that contains AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 340 — 06.02.01-53	2	2
RAI 340 — 06.02.01-54	3	3
RAI 340 — 06.02.01-55	4	11
RAI 340 — 06.02.01-56	12	12
RAI 340 — 06.02.01-57	13	13

A complete answer is not provided for 4 of the 5 questions. The schedule for a technically correct and complete response to these questions is provided below.

Question #	Response Date
RAI 340 — 06.02.01-53	May 12, 2010
RAI 340 — 06.02.01-54	April 7, 2010
RAI 340 — 06.02.01-56	April 7, 2010
RAI 340 — 06.02.01-57	April 7, 2010

Sincerely,

Martin (Marty) C. Bryan
Licensing Advisory Engineer
AREVA NP Inc.
Tel: (434) 832-3016
Martin.Bryan@areva.com

From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Friday, January 29, 2010 10:23 AM
To: ZZ-DL-A-USEPR-DL
Cc: Jensen, Walton; Jackson, Christopher; Snodderly, Michael; Carneal, Jason; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 340 (4094), FSARCh. 6

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on December 6, 2009, and discussed with your staff on January 20, 2010. Drat RAI Questions 06.02.01-53 was modified as a result of that discussion. The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs. For any RAIs that cannot be answered within 30 days, it is expected that a date for receipt of this information will be provided to the staff within the 30 day period so that the staff can assess how this information will impact the published schedule.

Thanks,
Getachew Tesfaye
Sr. Project Manager
NRO/DNRL/NARP
(301) 415-3361

Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 3510

Mail Envelope Properties (2FBE1051AEB2E748A0F98DF9EEE5A5D49793E1)

Subject: Response to U.S. EPR Design Certification Application RAI No. 340, FSAR Ch. 6, Supplement 11
Sent Date: 11/2/2011 1:25:20 PM
Received Date: 11/2/2011 1:26:18 PM
From: WILLIFORD Dennis (AREVA)

Created By: Dennis.Williford@areva.com

Recipients:
"BENNETT Kathy (AREVA)" <Kathy.Bennett@areva.com>
Tracking Status: None
"DELANO Karen (AREVA)" <Karen.Delano@areva.com>
Tracking Status: None
"ROMINE Judy (AREVA)" <Judy.Romine@areva.com>
Tracking Status: None
"RYAN Tom (AREVA)" <Tom.Ryan@areva.com>
Tracking Status: None
"GUCWA Len (EXTERNAL AREVA)" <Len.Gucwa.ext@areva.com>
Tracking Status: None
"Tesfaye, Getachew" <Getachew.Tesfaye@nrc.gov>
Tracking Status: None

Post Office: auscharmx02.adom.ad.corp

Files	**Size**	**Date & Time**
MESSAGE	22584	11/2/2011 1:26:18 PM
RAI 340 Supplement 11 Response US EPR DC.pdf	203717	

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

Response to

Request for Additional Information No. 340, Supplement 11

01/29/2010

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 06.02.01 - Containment Functional Design
Application Section: 06.02.01

QUESTIONS for Containment and Ventilation Branch 1 (AP1000/EPR Projects)
(SPCV)

Question 06.02.01-57:

On November 18, 2009, the staff performed an audit of work package NI-1-3380 describing the calculation of IRWST level following a loss of coolant accident to be used in determining the NPSH available to safety related pumps that draw suction from the IRWST.

Describe how this calculation is made conservative for the NPSH calculation. Include the following considerations.

a) The volume of water assumed to remain in the reactor system.

b) The initial water volume in the IRWST.

c) The water retained on the floors: Include the geometric retention, floors with weirs and those without weirs. Include the dynamic retention with justification for the flow rate assumed to spill upon the floor. Appropriate reference and justification should be provided for the calculational methodology. Include all horizontal surfaces taking into account the approximately 150 compartments of the containment. Provide surface areas and assumed water heights. Provide the dimensions (height and width) of all water retaining weirs.

d) The water retained on vertical surfaces as a film: The film thickness will be a function of the surface height. Justify that a conservative height was used. Provide estimated vertical surface areas for all compartments (~150) and corresponding heights used in the calculations.

e) Water retention within potentially clogged strainers and trash racks. Justify the assumptions used.

f) Vapor and droplets in the containment atmosphere. Justify that a conservative pressure was used to calculate the vapor mass and that droplets were conservatively considered.

g) Water retention behind doors. Identify compartments where water retention could occur behind doors. Provide and justify the calculated water retention.

h) Identify each room that is assumed not to drain, thus filled with water in the water retention estimate. Indicate the size of the room and the assumed water height.

i) Describe other assumptions used and justify that they are conservative including the temperature of the water on the floors and IRWST, operation of the drain system, and any other assumptions made.

j) Provide a proposed ITAAC for inspection of the as built containment. The purpose of the inspection is to confirm that all potential water retention locations have been identified and the amount of water retention has been conservatively estimated for each potential location.

Response to Question 06.02.01-57:

Part a

The volume of water assumed to remain in the reactor coolant system (RCS) is conservatively based on the maximum mass of water that is reinjected into the RCS. A conservative value based on the reference plant analysis for total reinjection mass of approximately 363,825 lbm is used. This value is greater than the calculated value of 325,500 lbm, which is based on the floodable volume of the RCS.

Part b

The initial water volume in the in-containment refueling water storage tank (IRWST) is 500,342 gallons, which is based on the minimum required IRWST level at power with regard to emergency core cooling system (ECCS) analysis.

Part c

The water retained on the floor with weirs is dependent on the dynamic height of water retained above the weirs. On the Reactor Building (RB) heavy floor are four openings covered by trash racks, each bounded by 2-inch weirs, that provide flow paths for draining water back into the IRWST. It is assumed that one of the trash racks is clogged and only three are available for draining water back into the IRWST. The height of the water flow above the weirs is calculated based on three factors:

1. RCS break flow, condensation flow, and safety injection flows.
2. Total width of the weirs.
3. Height of the weirs.

To capture a more time-dependent flow onto the heavy floor, a combination of the break-flow data is taken from RELAP, the safety injection both spilled and injected, as well as the condensation flow.

The width of a weir around one trash rack is 22.1 feet. The weir width around three trash racks, used for determining the dynamic weir height, is 66.3 feet.

Compartments that drain onto the heavy floor total 98,953.52 ft^2 for 23.42 percent of total surface area.

The dynamic height above the weirs of flooding vents in the lower annular space is calculated using the same methodology. However, only the flow rate from condensation is used. For floors without weirs in the annular space, a dynamic height of 1/2-inch is assumed because water can be drained through the annular gaps.

Part d

The wall height used for calculating the liquid film thickness for each compartment is the entire length of the containment wall, which provides a conservative height of 134.2 feet.
Table 06.02.01-57-1 shows estimated vertical surface areas of the compartments.

Part e

In addition to assuming one clogged trash rack, it is also assumed that one of the four retaining baskets becomes clogged and completely fills with water. A space between the top of the retaining baskets and the bottom of the RB heavy floor allows the water in a clogged basket to spill over into the IRWST. The mass of water in the clogged retaining basket that must be calculated is the water in the basket above the IRWST level to the top of the basket.

Testing will establish that strainers do not become completely clogged.

Part f

The maximum mass of water in the steam phase is calculated based on conditions during the loss of coolant accident (LOCA). The steam partial pressure is used to calculate the total steam mass. Droplets in the containment atmosphere are conservatively considered based on data extracted (droplets volume fraction, droplets density, and room volume) from the multi-node GOTHIC containment model.

Part g

Table 06.02.01-57-2 lists rooms where condensate can collect, but may have limited or no available drain path. To calculate the amount of flooding retention in these rooms, every room in the containment is assumed to have the same steam volume fraction. It is also conservatively assumed that all of the energy absorbed by the heat structures relate to condensation of steam.

In Table 06.02.01-57-2, each room is conservatively assumed to receive flooding from other connected rooms.

Part h

The size and assumed water height for each room that will not drain is provided in Table 06.02.01-57-3.

Part i

Conservatism is applied to each individual water retention analysis performed, as appropriate. These conservatisms are as described in previous responses.

Part j

The water holdup calculations analyze a large break LOCA, two small break LOCA cases, and a small break in a pressurizer line. Table 06.02.01-57-4 lists the water retention results for each case, which yielded the smallest margin of water remaining in the IRWST required for net positive suction head (NPSH). The large break LOCA is found to be the most limiting case, and will be used in the tables and discussions for this response.

The mass of water holdup in the RB is examined during various phases of the transient: blowdown, refill/reflood, post reflood, peak containment pressure, peak IRWST temperature, and half peak containment pressure. There are several different categories analyzed for water holdup:

- Condensate on walls and ceilings.
- Water retained in steam and droplet phase within the containment atmosphere.
- Water retained on floors.

During blowdown, there may be sufficient pressure difference between the equipment space and the service space to force water from the IRWST into the annular area. Because the exact amount of IRWST water that could be displaced is dependent on a number of interrelated

factors for each break scenario in the water retention analysis for a large break LOCA, a worst case evaluation was made assuming that the annular area would instantly fill with IRWST liquid to the height of the weir. The identification of the water retention locations was previously identified and analyzed in detail as noted in the response to RAI 434, Supplement 5, Question 06.02.02-72. The response in RAI 434, Supplement 5, Question 06.02.02-72 forms the basis for the water retention ITAAC provided as discussed below. The results in Table 06.02.01-57-4 show that the water holdup is still within the margin of allowable IRWST inventory for NPSH.

Table 06.02.01-57-4 lists the total IRWST water volume and mass of retained water in the Reactor Building for each water retention location (area) during a transient. The amount of water retention has been conservatively estimated for each potential location. The total estimated maximum amount of water removed from the IRWST during LOCA recirculation and the mass of water in each stage is summed as discussed in the response to RAI 434, Supplement 5, Question 06.02.02-72. The accumulator injection and initial RCS inventory are subtracted from the total since this mass of water did not originate within the IRWST. As shown in Table 06.02.01-57-4, the maximum total water retention in the RB from the IRWST is 472,310 lbm for a large break LOCA and occurs at 29 seconds.

The minimum IRWST level during normal operation is -8.497 ft, which corresponds to a volume of 66,886 ft³. The minimum IRWST level for SIS pump NPSH during a Large Break LOCA recirculation is -10.20 ft, which corresponds to a water volume of 57,916 ft³.

The maximum allowable amount of water taken from the IRWST that can be retained in the reactor building is found for the limiting case of a Large Break LOCA by taking the difference of volumes at the minimum operating and minimum required NPSH levels. Using a density value of 61.68 lbm/ft³, which is based on the maximum normal operating temperature of 122°F the maximum allowable mass of retained water in the reactor building is found as calculated below.

$$(66{,}866\,ft^3 - 57{,}916\,ft^3) \cdot 61.68 \frac{lbm}{ft^3} = \text{ 552,036 lbm}$$

The Margin of Retained water between the maximum allowable of 552,036 lbm and the individual calculated retained values from Table 06.02.01-57-4 are listed in Table 06.02.01-57-5. As can be seen in Table 06.02.01-57-5, the minimum Margin of Retained water in the RB from the IRWST is 79,726 lbm and occurs at 29 seconds based on the maximum allowable amount of water taken from the IRWST of 552,036 lbm.

Therefore, for the ITAAC value a conservative estimate of the allowable amount of water taken from the IRWST of 525,000 lbm will be used. This value is shown in the markup of the U.S. EPR FSAR, Tier 1, Section 2.1.1.1, Table 2.1.1-8.

A summary of the water holdup evaluation is included in Section 3.2.5 of Technical Report ANP-10293P, Revision 3, “U.S. EPR™ Design Features to Address GSI-191.”

U.S. EPR FSAR, Tier 1, Section 2.1.1.1, Item 2.16 and Table 2.1.1-8, Item 2.27 will be added to require that inspections will be performed and dimensional deviations reconciled for dimensions used in the water retention analysis to determine the total allowable amount of water taken from the IRWST, which can be retained in the reactor building.

U.S. EPR FSAR, Tier 1, Section 2.2.2, Table 2.2.2-3, Items 7.10 b and 7.11b will be deleted because the new ITAAC inspection added to Section 2.1.1.1,Table 2.1.1-8, Item 2.27 eliminated the need for this inspection.

FSAR Impact:

a – i The U.S. EPR FSAR will not be changed as a result of this question.

j The U.S. EPR FSAR Tier 1, Section 2.1.1.1 and Table 2.1.1-8 will be revised as described in the response and indicated on the enclosed markup.
U.S. EPR FSAR, Tier 1, Section 2.2.2, Table 2.2.2-3 will be revised as described in the response and indicated on the enclosed markup.

Table 06.02.01-57-1—Estimated Vertical Surface Areas Compartments

Room	Description	Area of Walls (ft^2)
UJA04002	Spreading Area	2390.9
UJA04003	IRWST	53.8
UJA04004	KT (NI DVS) Sump Room	561.9
UJA04005	Flooding Device Compartment	1907.6
UJA04006	Flooding Device Compartment	1907.6
UJA04012	Elevator	533.9
UJA04013	Access Area	418.8
UJA07001	Reactor Cavity	1709.5
UJA07003	IRWST Area	2709.5
UJA07004	KT (NI DVS) Sump Room	592.1
UJA07012	Elevator	437.1
UJA07013	Access Area	1986.1
UJA07014	Pipe Penetrations	2751.5
UJA07015	Pipe Penetrations	2807.5
UJA07016	Pipe Penetrations	3340.4
UJA07017	Venting Area for Spreading Compartment	547.9
UJA07018	LCQ (SGBS) HX Room	1532.9
UJA07020	KT (NI DVS) Floor Drain and Tank Room	784.8
UJA07021	KTA10 (NI DVS) HX Room	574.8
UJA07022	KTA10 (NI DVS) Pumps Room	900.0
UJA07023	KTA10 (NI DVS) Floor Drain and Tank Room	803.1
UJA07024	KT (RCDT) Tank Room	771.8
UJA07026	KBA12 (CVCS) HX Room	713.7
UJA07027	KBA11 (CVCS) HX Room	734.2
UJA07028	KBA (CVCS) Valve Room	740.6
UJA07029	KBA (CVCS) Valve Room	582.4
UJA11001	JAA10 (RPV) Room	1095.9
UJA11002	JEB10 (RCP) Oil Collection Tank Area	932.2
UJA11003	JEA10 (SG) Supports Area	504.9
UJA11004	JEA20 (SG) Supports Area	504.9
UJA11005	JEB20 (RCP) Oil Collection Tank Area	936.6
UJA11006	JEB30 (RCP) Oil Collection Tank Area	936.6
UJA11007	JEA30 (SG) Supports Area	504.9
UJA11008	JEA40 (SG) Supports Area	504.9
UJA11009	JEB40 (RCP) Oil Collection Tank Area	932.2
UJA11010	South Staircase	574.8
UJA11012	Elevator	419.8
UJA11013	Loop 1 Annular Area 180-270°	2488.9
UJA11014	Loop 2 Annular Area 270-0°	1820.4
UJA11015	Loop 3 Annular Area 0-90°	1906.5
UJA11016	Loop 4 Annular Area 90-180°	2505.0

Table 06.02.01-57-1—Estimated Vertical Surface Areas Compartments

Room	Description	Area of Walls (ft^2)
UJA11017	Venting Area for Spreading Compartment	724.5
UJA11018	LCQ50 (SGBS) Tank Room	2146.5
UJA11019	JEG (PRT) Tank Room	1537.2
UJA11020	Access to Personnel Airlock	1711.6
UJA11021	FAL (FPPS) Valve Room	591.0
UJA11022	KBA (CVCS) Valve Room	856.9
UJA11023	KBA (CVCS) Valve Room	1398.4
UJA11024	KBA10 (CVCS) HX Room	812.8
UJA11025	JND & JNG (MHSI & LHSI) Valve 1 Room	818.1
UJA11026	JND & JNG (MHSI & LHSI) Valve 2 Room	747.1
UJA11027	JND & JNG (MHSI & LHSI) Valve 3 Room	747.1
UJA11028	JND & JNG (MHSI & LHSI) Valve 4 Room	818.1
UJA11031	Access to Loop 1 & 2 Area	478.0
UJA11032	Access to Loop 3 & 4 Area	478.0
UJA15001	Reactor Cavity	1446.8
UJA15002	JEB10 Pump (RCP) Room	1242.3
UJA15003	JEA10 (SG) Support Area	1382.2
UJA15004	JEA20 (SG) Support Area	1409.1
UJA15005	JEB20 Pump (RCP) Room	1303.6
UJA15006	JEB30 Pump (RCP) Room	1303.6
UJA15007	JEA30 (SG) Support Area	1409.1
UJA15008	JEA40 (SG) Support Area	1382.2
UJA15009	JEB40 Pump (RCP) Room	1242.3
UJA15010	South Staircase	647.0
UJA15011	North Staircase	806.3
UJA15012	Elevator	313.3
UJA15013	JNG13 (LHSI) Tank & Loop 1 Annular Area	2296.2
UJA15014	JNG23 (LHSI) Tank & Loop 2 Annular Area	2932.4
UJA15015	JNG33 (LHSI) Tank & Loop 3 Annular Area	3110.0
UJA15016	JNG43 (LHSI) Tank & Loop 4 Annular Area	2526.5
UJA15017	Core Internals Storage Room	426.3
UJA15018	Spray Lines Area	937.6
UJA15019	Surge Line Area	1124.9
UJA15020	Access to Transfer Tube Compartment	793.4
UJA15021	Transfer Tube Compartment	797.7
UJA15023	Instrumentation Lances Storage Room	503.8
UJA15024	Access to Reactor Cavity	396.2
UJA15025	FAL (FPPS) Room	564.1
UJA15026	HVAC	648.1
UJA15027	HVAC	648.1
UJA18001	Reactor Cavity	2099.2
UJA18002	JEB10 Pump (RCP) Room	1784.8

Table 06.02.01-57-1—Estimated Vertical Surface Areas Compartments

Room	Description	Area of Walls (ft^2)
UJA18003	JEA10 (SG) Room	1356.4
UJA18004	JEA20 (SG) Room	1395.1
UJA18005	JEB20 Pump (RCP) Room	1872.0
UJA18006	JEB30 Pump (RCP) Room	1872.0
UJA18007	JEA30 (SG) Room	1395.1
UJA18008	JEA40 (SG) Room	1356.4
UJA18009	JEB40 Pump (RCP) Room	1784.8
UJA18010	South Staircase	929.0
UJA18011	North Staircase	1158.3
UJA18012	Elevator	586.7
UJA18013	JNG13 (LHSI) Tank & Loop 1 Annular Area	3763.4
UJA18014	JNG23 (LHSI) Tank & Loop 2 Annular Area	4494.4
UJA18015	JNG33 (LHSI) Tank & Loop 3 Annular Area	4203.7
UJA18016	JNG43 (LHSI) Tank & Loop 4 Annular Area	3830.2
UJA18017	Core Internals Storage Room	1707.3
UJA18018	Spray Lines Area	1723.5
UJA18019	Surge Line Area	1723.5
UJA18020	Corridor	1002.2
UJA18021	Transfer Tube Compartment	1088.3
UJA18023	Instrumentation Lances Storage Room	1189.5
UJA18026	HVAC	931.2
UJA18027	HVAC	931.2
UJA23001	Reactor Cavity	1914.0
UJA23002	JEB10 Pump (RCP) Room	1644.9
UJA23003	JEA10 (SG) Room	1516.8
UJA23004	JEA20 (SG) Room	1559.8
UJA23005	JEB20 Pump (RCP) Room	2092.7
UJA23006	JEB30 Pump (RCP) Room	2092.7
UJA23007	JEA30 (SG) Room	1559.8
UJA23008	JEA40 (SG) Room	1516.8
UJA23009	JEB40 Pump (RCP) Room	1644.9
UJA23010	South Staircase	1038.8
UJA23011	North Staircase	1295.0
UJA23012	Elevator	655.6
UJA23013	JNG13 (LHSI) Tank & Loop 1 Annular Area	3781.7
UJA23014	JNG23 (LHSI) Tank & Loop 2 Annular Area	4111.1
UJA23015	JNG33 (LHSI) Tank & Loop 3 Annular Area	3843.1
UJA23016	JNG43 (LHSI) Tank & Loop 4 Annular Area	3829.1
UJA23017	HVAC	2993.7
UJA23018	HVAC	1437.1
UJA23019	JEF10 (RCS) Pressurizer Room	1966.8
UJA23020	FAL (FPPS) Valve Room	920.4

Table 06.02.01-57-1—Estimated Vertical Surface Areas Compartments

Room	Description	Area of Walls (ft^2)
UJA23021	Transfer Tube Compartment	1216.4
UJA23023	Instrumentation Lances Storage Room	1316.6
UJA23026	HVAC Duct	648.1
UJA23027	HVAC Duct	648.1
UJA23031	FAL (FPPS) Pump Room	924.7
UJA23041	Instrumentation Measuring Table Room	917.2
UJA23042	Instumentation Measuring Cabinets Room	1240.1
UJA29003	JEA10 (SG) Room	1174.5
UJA29004	JEA20 (SG) Room	11669.2
UJA29005	JEB20 Pump (RCP) Room	1121.7
UJA29006	JEB30 Pump (RCP) Room	1179.8
UJA29007	JEA30 (SG) Room	1166.9
UJA29008	JEA40 (SG) Room	1174.5
UJA29011	North Staircase	1031.3
UJA29012	Elevator	405.8
UJA29013	Setdown Area, Operating Floor	4021.8
UJA29014	Annular Area, 240-0°	3699.9
UJA29015	Annular Area, 0-120°	3423.3
UJA29016	Access to Equipment Hatch	2988.4
UJA29018	Access to Operating Floor	1156.2
UJA29019	JEF10 (RCS) Pressurizer Room	1385.5
UJA29022	KLA51/52 Compressor & KLA50 Filter (CBVS) Room	1567.4
UJA29023	Access to Emergency Airlock	1441.4
UJA29025	HVAC Shaft	483.3
UJA29026	HVAC Shaft	483.3
UJA34003	JEA10 (SG) Room	1863.4
UJA34004	JEA20 (SG) Room	1851.6
UJA34005	JEB20 Pump (RCP) Room	1072.2
UJA34006	JEB30 Pump (RCP) Room	1128.2
UJA34007	JEA30 (SG) Room	1851.6
UJA34008	JEA40 (SG) Room	1863.4
UJA34011	North Staircase	862.3
UJA34012	Elevator	344.5
UJA34013	Setdown Area, Operating Floor	4969.1
UJA34014	Annular Area, 240-0°	5205.9
UJA34015	Annular Area, 0-120°	4189.7
UJA34018	RPV Closure Head Storage Area	1431.7
UJA34019	Pressurizer Head & Safety Relief Valves Room	879.5
UJA34022	JEG (RPS) Valve Room	971.0
UJA34025	HVAC Shaft	348.8
UJA34026	HVAC Shaft	348.8
UJA41003	JEA10 (SG) Room	842.9

Table 06.02.01-57-1—Estimated Vertical Surface Areas Compartments

Room	Description	Area of Walls (ft^2)
UJA41004	JEA20 (SG) Room	837.5
UJA41007	JEA30 (SG) Room	837.5
UJA41008	JEA40 (SG) Room	842.9
UJA41013	Setdown Area, Operating Floor	7000.5
UJA41014	Annular Area, 240-0°	5597.8
UJA41015	Annular Area, 0-120°	5202.7
UJA40001	Dome	25214.8

Table 06.02.01-57-2—Flooding from Connected Rooms

Room	Description	Connected Rooms	Surface Area (ft^2)	% of Total SA
UJA04005	KT (NI DVS) Sump Room	UJA04005	2010.43	0.48
		UJA07022	1623.37	0.38
		UJA07024	1431.06	0.34
		Total	**5064.86**	**1.20**
UJA04006	Flooding Device Compartment	UJA04006	2010.43	0.48
		UJA07023	1386.95	0.33
		UJA07020	1470.19	0.35
		Total	**4867.58**	**1.15**
UJA04012	Elevator	UJA04012	574.49	0.14
		UJA07012	437.14	0.10
		UJA11012	419.89	0.10
		UJA15012	313.46	0.07
		UJA18012	586.69	0.14
		UJA23012	655.72	0.16
		UJA29012	406.18	0.10
		UJA34012	404.65	0.10
		Total	**3798.23**	**0.90**
UJA11010	South Staircase	UJA11010	657.95	0.16
		UJA15010	646.68	0.15
		UJA18010	929.04	0.22
		UJA23010	1038.34	0.25
		Total	**3272.00**	**0.77**
UJA15011	North Staircase	UJA15011	994.15	0.24
		UJA18011	1158.30	0.27
		UJA23011	1294.58	0.31
		UJA29011	1030.90	0.24
		UJA34011	1056.66	0.25
		Total	**5534.59**	**1.31**
UJA15020	Access to Transfer Tube Compartment	UJA15020	1232.47	0.29
		UJA15021	1087.95	0.26
		Total	**2320.42**	**0.55**
UJA29025	HVAC Shaft	UJA29025	521.88	0.12
		UJA34025	348.43	0.08
		Total	**870.32**	**0.21**
UJA29026	HVAC Shaft	UJA29026	521.88	0.12
		UJA34026	348.43	0.08
		Total	**870.32**	**0.21**
UJA34018	RPV Closure Head Storage Area	UJA34018	2136.58	0.51
		Total	**2136.58**	**0.51**

Table 06.02.01-57-3—Room Area and Water Height

Room	Floor Area (ft^2)	Depth of Retained Water (ft) at Time					
		29 s	60 s	600 s	3600 s	12304 s	40122 s
UJA04005	103.33	0.05250	0.09671	0.35383	0.85823	1.55138	2.36728
UJA04006	103.33	0.05046	0.09294	0.34005	0.82480	1.49096	2.27507
UJA04012	40.90	0.09946	0.18322	0.67034	1.62595	2.93915	4.48488
UJA11010	82.88	0.04229	0.07789	0.01610	0.00361	0.00081	0.00007
UJA15011	188.37	0.03147	0.05797	0.04605	0.01034	0.00231	0.00020
UJA15020	219.58	0.01132	0.02085	0.00810	0.00182	0.00041	0.00003
UJA29025	38.75	0.02406	0.04432	0.16213	0.39326	0.71088	1.08475
UJA29026	38.75	0.02406	0.04432	0.16213	0.39326	0.71088	1.08475
UJA34018	705.04	0.00325	0.00598	0.02188	0.05306	0.09592	0.14636

Table 06.02.01-57-4: Water Retention Results and Margins

Large Break LOCA Case						
Time (s)	29	60	600	3,600	12,305	40,123
Total IRWST Water Loss (lbm)	472,310	229,104	216,071	252,718	262,050	187,635
Margin Above Allowable (lbm)	79,726	322,932	335,965	299,318	289,986	364,401
9" Small Break LOCA Case						
Time (s)	61	1,840	3,600	36,000	86,400	
Total IRWST Water Loss (lbm)	253,744	39,471	25,443	222,980	193,796	
Margin Above Allowable (lbm)	1,300,283	871,625	767,699	536,560	516,823	
3" Small Break LOCA Case						
Time (s)	108	5,350	22,413	36,000	86,400	
Total IRWST Water Loss (lbm)	229,134	213,585	621,406	596,324	585,210	
Margin Above Allowable (lbm)	949,477	1,108,187	477,462	485,890	474,628	
3" Small Break in the Pressurizer Lines (Based on 3" Small Break LOCA)						
Time (s)	108	5,350	22,413	36,000	86,400	
Total IRWST Water Loss (lbm)	299,134	213,585	940,008	915,459	905,517	
Margin Above Allowable (lbm)	949,477	1,108,187	158,860	166,755	154,321	

Table 06.02.01-57-5: Margin of Retained Water

Time (s)	29	60	600	3,600	12,305	40,123
Maximum Allowable IRWST	552,036	552,036	552,036	552,036	552,036	552,036

Water Loss (lbm)						
Total IRWST Water Loss (lbm)	472,310	229,104	216,071	252,718	262,050	187,635
Margin of IRWST Water Loss (lbm)	79,726	322,932	335,965	299,318	289,986	364,401

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2.9 RBA penetrations that contain high-energy ~~pipe~~lines, as ~~described~~ listed in Table 2.1.1 7, have guard pipes.

2.10 Essential equipment required for plant shutdown located in the RB and RBA is located above the internal flood level.

2.11 The reactor pressure vessel, reactor coolant pumps, pressurizer, steam generators, and interconnecting RCS piping are insulated with reflective metallic insulation.

2.12 The RB structures have key dimensions specified in Table 2.1.1-5~~that are confirmed after construction~~.

2.13 The RCB has a minimum containment free volume ~~that is confirmed after construction~~.

2.14 The RCB and RB internal structures have a minimum containment heat sink surface area ~~value~~.

2.15 The integrated leak rate from the RCB does not exceed the maximum allowable leakage rate.

2.16 The location of the doors and blowout panels is as listed in Table 2.1.1-6(a).

2.17 ~~Seismic Category I~~Pressure relief doors ~~and blowout panels can~~ in the RCB listed in Table 2.1.1-6(a) are designed and constructed to withstand seismic design basis loads without a loss of the function listed.

2.18 ~~Doors~~ RCB doors and blowout panels provide pressure relief.

2.19 ~~Doors~~ RCB doors with blowout panels listed in Table 2.1.1-6(a) are provided with missile restraint.

2.20 ~~Vent~~ RCB vent path areas provide ~~room (compartment)~~ pressure relief for the rooms listed in Table 2.1.1-6(b).

2.21 The RCB has a maximum volume of Microtherm insulation within the Zone of Influence.

2.22 Deleted.~~The coatings in the RCB are qualified.~~

2.23 Coatings in the RCB are consistent with the GSI 191 DBA evaluation.~~RCB coatings in the zone of influence areas have a maximum thickness.~~

2.24 Thermal Properties of the RCB Concrete Mix Design are as defined in the Construction Specification.

2.25 Fire protection features provide separation within the RBA.

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2.26 Fire protection features provide separation within the RCB.

2.27 The IRWST has sufficient mass to compensate for water retention in the RCB and RB internal structures.

Table 2.1.1-8—Reactor Building ITAAC (6 Sheets)

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
		d. A post-fire safe shutdown analysis will be performed.	d. The post-fire safe shutdown analysis concludes that at least one success path is available for safe shutdown.
2.26	Thermal properties of the RCB Concrete Mix Design are as defined in the Construction Specification	a. Inspections will be performed for the existence of ASME Code Section III, Division 2 Construction Specification(s) defining the thermal properties of the RCB Mix Design. b. Testing of the Concrete Mix Design will be performed.	a. ASME Code Section III, Division 2, (CC-2230) test records exist for the RCB Concrete Mix Design. b. ASME Code Section III, Division 2, (CC-2230) test records exist for the RCB Concrete Mix Design and conclude that it meets the thermal properties specified.
2.27	The IRWST has sufficient mass to compensate for water retention in the RCB and RB internal structures.	During construction, inspections will be performed and dimensional deviations from the RCB and RB internal structures will be analyzed for impact on the IRWST water retention mass.	Reconciliation of the dimensional deviations to the RCB and RB internal structures concludes that the water retention is less than or equal to 535,000 lbm.

06.02.01-57

Table 2.2.2-3—In-Containment Refueling Water Storage Tank System ITAAC (9 Sheets)

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
7.6	Deleted.	Deleted.	Deleted.
7.7	The IRWST provides water to flood the spreading area.	An inspection will be performed of the IRWST and severe accident heat removal system piping to provide water to flood the spreading area.	The IRWST and interfacing severe accident heat removal system pipe configuration provides a flow path to the core spreading area.
7.8	The IRWST has a retaining basket located directly below each heavy floor opening.	a. An inspection will be performed for the existence of a retaining basket in the IRWST directly under each heavy floor opening. b. An inspection and analysis will be performed to verify the minimum surface area and maximum mesh grid opening of the retaining basket.	a. A retaining basket exists in the IRWST directly below each heavy floor opening. b. The retaining basket has a minimum surface area of 721 ft2 and a maximum grid opening of 0.08 x 0.08 inches.
7.9	The IRWST has a trash rack located over each heavy floor opening.	a. An inspection will be performed for the existence of a trash rack over each heavy floor opening. b. An inspection will be performed to verify the maximum mesh grid opening of the trash rack.	a. A trash rack exists over each heavy floor opening to the IRWST. b. The trash rack has a maximum mesh grid opening of 4 x 4 inches.
7.10	The IRWST has a weir located around each trash rack at the heavy floor opening.	~~a.~~ An inspection will be performed for the existence of a weir around each trash rack at the heavy floor opening. ~~b. An inspection will be performed to verify the height of the weir around each trash rack at the heavy floor opening.~~	~~a.~~ A weir exists around each trash rack at the heavy floor opening. ~~b. The weir has a minimum height of 2 inches.~~
7.11	The IRWST has a weir located at the annular space wall openings.	~~a.~~ An inspection will be performed for the existence of a weir at the annular space wall openings.	~~a.~~ A weir exists at the annular space wall opening.

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Table 2.2.2-3—In-Containment Refueling Water Storage Tank System ITAAC (9 Sheets)

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
		~~b. An inspection will be performed to verify the height of the weir at the annular space wall openings.~~	~~b. The weir has a minimum height of 4 inches.~~

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